PIVOTAL JOYSTICK BASE

BACKGROUND OF THE INVENTION

This invention relates to pivotal positioning of joystick bases for powered wheelchairs and other mechanisms.

Joysticks for controlling powered wheelchairs generally extend forwardly from armrests where the joysticks and joystick assemblies often obstruct desirable closeness of the wheelchairs and occupants thereof to tables, desks, workstations and other structures. There are no known adjusters of distance and lateral positioning of joystick bases from the armrests to allow closeness of the powered wheelchairs to desired objects conveniently, reliably and inexpensively in a manner taught by this invention.

Examples of most-closely related known but different devices are described in the following patent documents:

U.S. Patent No. (U.S. unless stated otherwise)	Inventor	Filing Date
5,326,063	Stevens	07-05-1994
5,893,607	Trimnell	04-13-1999
6,086,156	Breen, *et al.*	07-11-2000
5,169,210	Fricano	12-08-1992
6,352,302	Piretti, Jr.	03-05-2002
5,026,114	Miller	06-25-1991
5,954,393	Perrin	09-21-1999
5,947,501	Osborn	09-07-1999

SUMMARY OF THE INVENTION

Objects of patentable novelty and utility taught by this invention are to provide a pivotal joystick base which:

allows a forwardly obstructive joystick assembly to be moved conveniently to a non-obstructive position laterally to a side of a chair member to which the joystick base is attached pivotally;

provides locking of the joystick base in the non-obstructive position for operation of the joystick in a non-obstructive position;

provides linear positioning of the joystick base from the chair member;

provides directional positioning of a joystick assembly on the joystick base selectively; and

is inexpensive.

This invention accomplishes these and other objectives with a pivotal joystick base having a pivot end and a base end. The pivot end is pivotal horizontally on a base pivot that is affixed to a chair attachment. The base end is adapted to support a joystick assembly. The base pivot includes a pivot lock with which the joystick base is lockable in a pivoted position selectively. The base end can include an assembly pivot with which the joystick assembly is rotative to a forward position in compensation for rotational positioning of the joystick assembly by lateral pivoting of the joystick base. The joystick base can include a linear mount for linear distancing of the joystick assembly from the base pivot selectively.

The above and other objects, features and advantages of the present invention should become even more readily apparent to those skilled in the art upon a reading

of the following detailed description in conjunction with the drawings wherein there is shown and described illustrative embodiments of the invention.

BRIEF DESCRIPTION OF DRAWINGS

This invention is described by appended claims in relation to description of a preferred embodiment with reference to the following drawings which are explained briefly as follows:

FIG. 1 is a side elevation view of a pivotal joystick base having a pivot lock with a spring-pressured member and mounted on a dashed-line representation of a motorized wheel chair;

FIG. 2 is a partially cutaway and expanded view of the pivotal joystick base shown in **FIG. 1**;

FIG. 3 is a front elevation view of the dashed-line representation of the motorized wheelchair on which the **FIG. 1** pivotal joystick base is positioned with a dashed-line representation of a joystick base pivoted laterally to a side;

FIG. 4 is an expanded fragmentary top view of the **FIG. 1** pivotal joystick base pivoted laterally;

FIG. 5 is a bottom view of the **FIG. 4** illustration;

FIG. 6 is a partially cutaway side elevation view of the pivotal joystick base having a pivot lock with a pivot lock having a latch that is movable downwardly from a latch knob to a latch notch proximate a base pivot;

FIG. 7 is an expanded fragmentary top view of the **FIG. 6** pivotal joystick base with a dashed-line representation of the base bar pivoted laterally from an armrest of the motorized wheelchair;

FIG. 8 is a partially cutaway and expanded fragmentary side view of the pivot lock of the **FIG. 6** illustration;

FIG. 9 is a partially cutaway and expanded fragmentary top view of the pivot end of the base rod of the **FIG. 6** embodiment;

FIG. 10 is a partially cutaway and expanded fragmentary side view of the chair attachment of the **FIG. 6** embodiment;

FIG. 11 is a partially cutaway and expanded fragmentary top view of the chair attachment of the **FIG. 10** illustration;

FIG. 12 is a partially cutaway top view of the **FIG. 6** embodiment showing selectively lateral positioning and forward rotating of the joystick assembly;

FIG. 13 is a partially cutaway and expanded fragmentary top view of the **FIG. 6** embodiment showing selectively linear and rotational positioning of the joystick assembly on the base rod;

FIG. 14 is a partially cutaway side elevation view of the **FIG. 6** embodiment with a flush knob and having an attachment plate on the chair attachment;

FIG. 15 is a partially cutaway and expanded fragmentary top view of the **FIG. 6** embodiment showing the attachment plate on the chair attachment;

FIG. 16 is a partially cutaway and expanded fragmentary side view of the **FIG. 1** embodiment showing the attachment plate on the chair attachment; and

FIG. 17 is a partially cutaway side view of the **FIG. 6** embodiment having a resilient section in the latch.

DESCRIPTION OF PREFERRED EMBODIMENT

Listed numerically below with reference to the drawings are terms used to describe features of this invention. These terms and numbers assigned to them designate the same features throughout this description.

1. Base bar
2. Base pivot
3. Chair attachment
4. Motorized chair
5. Joystick assembly
6. Pivot axle
7. Spring-pressured member
8. Positional recess
9. Spring
10. Adjustment bolt
11. Lock cylinder
12. Attachment bar
13. Attachment plate
14. Fasteners
15. Fastener orifices
16. Armrest
17. Approachable object
18. Stop
19. Lock-notch surface
20. Pivot base
21. Lock notch
22. Latch
23. Latch aperture
24. Latch tip
25. Bar knob
26. Actuator portion
27. Latch knob
28. Flush knob
29. Knob bay
30. Fastener aperture
31. Assembly fastener
32. Slot
33. Assembly knob
34. Resilient section

Referring to **FIGS. 1-5**, a pivotal joystick base has a base bar **1** with a pivot end and a base end. The pivot end is pivotal horizontally on a base pivot **2** that is affixed to a chair attachment **3** that is articulated for attachment to a motorized chair **4** predeterminedly. The base end is adapted to support a joystick assembly **5**. The base pivot **2** has a pivot lock for locking the base bar **1** in a pivoted position selectively.

In a first preferred embodiment, the base pivot **2** includes a pivot axle **6** that is oriented vertically on the chair attachment **3** for horizontal pivoting of the base bar **1**. The pivot lock includes a spring-pressured member **7** that is preferably a sphere

or a ball which is spring-pressured upwards vertically into contact with an underside of the base bar **1** and into at least one positional recess **8** in the underside of the base bar **1** for soft-locking the spring-pressured member **7** in the positional recess **8** at a pivotal position of the base bar **1** predeterminedly.

The spring-pressured member **7** is spring-pressured upwards vertically with a spring **9** having spring pressure variable with an adjustment bolt **10** having an axis that is collinear to an axis of the spring-pressured member **7** for entrance into the positional recess **8**. The spring-pressured member **7**, which is preferably a sphere or ball as shown, is positioned in a top portion of a lock cylinder **11** in which a preferably helical spring **9** is positioned below the spring-pressured member. The adjustment bolt **10**, preferably a recessed set-screw, is threaded into a bottom portion of the lock cylinder **11** for adjusting tension of the helical spring **9** against the spring-pressured member **7**.

The chair attachment can include an attachment bar **12** as shown in **FIGS. 1-2, 4-7,** and **10-13**, or an attachment plate **13** with fasteners **14** in fastener orifices **15** as shown in **FIGS. 14-16**. The attachment bar **12** or the attachment plate **13** are articulated for being fastened to particular structures of the motorized chair **4** preferably and usually proximate an armrest **16** on either a left or a right side of the motorized chair **4**.

The pivotal joystick base allows the armrests **16** of the motorized chair **4** to be positioned closer to and quite often under an approachable object **17** which is shown in dashed lines in **FIGS. 1-2,** and **4-7** to represent a table, desk, workstation, wall, door or other approachable object **17**. Usually, the joystick assembly **5** on a motorized chair **4** protrudes approximately six inches in front of the armrest **16**.

This prevents a user of the motorized chair **4** from getting close enough to the table, desk, workstation, wall, door or other approachable object **17** to use it effectively. With the pivotal joystick base, the joystick assembly **5** can be swung, pushed or pivoted to a side or backwards where it is out of the way.

In the embodiments shown in **FIGS. 1-5**, the base bar **1** is soft-locked in a forward position from which there can be an easy breakaway laterally to a side or slightly backwards if desired. Preferably for most users, however, there is also a stop **18** on a bottom side of the base bar **1** as shown in **FIG. 5** for contacting the chair attachment **3** to prevent inward pivoting of the base bar **1** to a position of contact of the base end with a front portion of a user.

Referring to **FIGS. 6-15** and **17**, a second preferred embodiment has the pivot axle **6** extended upwards vertically from a lock-notch surface **19** on the chair attachment **3** for horizontal pivoting of the base bar **1** on the pivot axle **6** vertically above the lock-notch surface **19** which can be on a pivot base **20** on the chair attachment **3**. The lock-notch surface **19** includes a predetermined plurality of lock notches **21** positioned predeterminedly circumferential at a design notch distance radially from the pivot axle **6**. The pivot lock includes a latch **22** that is movable upwardly and downwardly in a latch aperture **23** in the base rod **1** at the notch distance from the pivot axle **6**. The latch **22** includes a latch tip **24** that is positioned in a select one of the lock notches **21** for locking the base bar **1** in a selected pivotal direction from the pivot axle **6**. The latch tip **24** is removed from any of the lock notches **21** for pivoting the base bar **1** to a selected pivotal direction from the pivot axle **6**. The lock notches **21** are articulated to receive the latch tip **24** predeterminedly.

The latch **22** can include a latch actuator in a bar nob **25** that is affixable to a topside of the pivot end of the base bar **1**. The latch actuator can include internal fastener threads in the bar knob **25** and matching external threads in an actuator portion **26** of the latch **22**. The latch **22** can have a latch handle which can include a latch knob **27** for rotating the latch **22** in an upward-rotational direction to unscrew the latch tip **24** from any one of the lock notches **21** and for rotating the latch **22** in a downward-rotational direction to screw the latch tip **24** into a select one of the lock notches **21**.

As shown in **FIGS. 14-15**, the latch **22** can include a recessed flush knob **28** that is recessed in a knob bay **29** in the bar knob **25**.

The latch tip **24** is preferably conical and the lock notches **21** are matched conically for receiving the latch tip **24**.

As shown in **FIGS. 1-2**, the base bar **1** includes a fastener aperture **30** through which an assembly fastener **31** is inserted and tightened to position the joystick assembly **5** in a desired rotational direction for joystick control of the motorized chair **4**.

As shown in **FIGS. 7** and **12-14**, the base bar **1** can include a fastener aperture that is a slot **32** predeterminedly intermediate the latch end and the pivot end of the base bar **1** for positioning the joystick assembly **5** linearly along the base bar **1** selectively.

As shown in **FIG. 14**, the assembly fastener **31** can include an assembly knob **33** for hand-rotating the assembly fastener **31**.

Shown in **FIGS. 12-13** is forward rotational positioning of the joystick assembly **5** for control in any direction of rotation to compensate for rotation of the

joystick assembly **5** resulting from pivotal positioning of the base bar **1** in combination with linear positioning of the joystick assembly **5** along the base bar **1** selectively.

As shown in **FIG. 17**, the latch **22** can include a resilient section **34** that is affixed to the latch **22** and to the actuator portion **26** at oppositely disposed ends of the resilient section **34** respectively for inserting the latch tip **24** into and removing it from the latch notches **21** selectively by rotation of the latch knob **27**. This allows spring-pressured downward travel of the latch tip **24** for finding a latch notch **21** while the base bar **1** is being pivoted in a desired rotational position for the joystick assembly **5**. It also provides rigid pivotal positioning of the joystick assembly **5** for its control operation wherever desired within a pivotal range.

A new and useful pivotal joystick base having been described, all such foreseeable modifications, adaptations, substitutions of equivalents, mathematical possibilities of combinations of parts, pluralities of parts, applications and forms thereof as described by the following claims and not precluded by prior art are included in this invention.